

Psychophysiological response to acute-high-stress combat situations in professional soldiers

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Abstract

The study of psychophysiological responses of soldiers in combat situations remains a challenge, especially in melee combat—a close proximity unarmed fight—defined by high unpredictability. Gaining knowledge about psychophysiological changes in high-stress situations is required to optimise training. This study aimed to analyse modifications in autonomic modulation, cortical arousal, heart rate, muscle strength, blood lactate concentration, and rating of perceived exertion of veteran soldiers in a melee combat simulation. Twenty veteran soldiers were analysed before and after a melee combat simulation in accordance with realistic situations that occur in actual operations areas. The simulation consisted of actions performed by a binomial unit in a security and protection mission in an operations area. The melee combat caused an increase in sympathetic modulation, blood lactate concentration, heart rate, muscle strength, a decreased tendency in cortical arousal, and a lower rating of perceived exertion than the organic response measured. An intense fight–flight response was observed in soldiers by the limbic system activation, causing a misinterpretation of perceived exertion. Finally, implications for the design of simulation environments for tactics training in high-stress professions are discussed.

Keywords:

autonomic nervous system, cortical arousal, soldier, strength, stress